

REMARKS

This is a full and timely response to the non-final Office Action of April 9, 2007.

Reexamination, reconsideration, and allowance of the application and all presently pending claims are respectfully requested.

Upon entry of this First Response, claims 1, 3-8, 12-14, 16, 17, and 21-31 are pending in this application. Claims 1, 5-8, 12-14, 16, and 17 are directly amended herein. Furthermore, claims 2, 9-11, 15, and 18-20 are canceled without prejudice or disclaimer, and claims 21-31 are newly added. It is believed that the foregoing amendments add no new matter to the present application.

Response to §101 Rejections

Claims 1, 3-8, 12-14, 16, and 17 are rejected under 35 U.S.C. §101 as allegedly being directed to non-statutory subject matter. In particular, it alleged in the Office Action that claim 1 appears to be comprised of software alone and is "not supported by either a specific and substantial asserted utility (i.e., transformation of data) or a well established utility (i.e., a practical application)." Applicants respectfully submit that there is nothing in claim 1 that requires the recited "system" to be implemented exclusively in software. Indeed, claim 1 recites a "buffer" and a "cache," which are well-known structures for storing data. Further, claim 1 recites "logic," which can be implemented in either hardware or software, and there is nothing in claim 1 that requires the "logic" to be implemented only in software.

In addition, Applicants respectfully assert that each of the pending claims is directed to a practical application. In particular, each claim recites purging a translation pair from a translation lookaside buffer (TLB) or a system or process that is configured to purge a translation pair from a TLB. It is well-known that such a feature helps to prevent address errors within a computer

system by removing stale translation pairs from the TLB. Accordingly, each claim has a practical application and is directed to statutory subject matter.

Furthermore, it is well settled that the subject matter of a claim can be statutory under 35 U.S.C. §101 even if it contains some elements that would, by themselves, be considered non-statutory. In particular, it has been held that:

"It is thus not necessary to determine whether a claim contains, as merely a part of the whole, any mathematical subject matter which standing alone would not be entitled to patent protection. Indeed, because the dispositive inquiry is whether the claim *as a whole* is directed to statutory subject matter, it is irrelevant that a claim may contain, as part of the whole, subject matter which would not be patentable by itself. *In re Alappat*, 33 F.3d 1526, 1543, 31 U.S.P.Q.2d 1545 (Fed. Cir. 1994) (emphasis in original).

Moreover, even though the claims recite elements that, by themselves, do not establish a practical application, Applicants respectfully assert that, when the claims are properly viewed as a whole, it is readily apparent that each claim is directed to at least one practical application and is, thus, statutory.

For at least the above reasons, Applicants request that the 35 U.S.C. §101 rejections of claims 1, 3-8, 12-14, 16, and 17 be withdrawn.

Response to §112 Rejection

Claim 5 presently stands rejected under 35 U.S.C. §112, second paragraph, as allegedly failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Claim 5 has been amended thereby mooted the rejection of claim 5 under 35 U.S.C. §112, second paragraph. Thus, Applicants respectfully request that the 35 U.S.C. §112, second paragraph, rejection of claim 5 be withdrawn.

Response to §102 and §103 Rejections

A proper rejection of a claim under 35 U.S.C. §102 requires that a single prior art reference disclose each element of the claim. See, e.g., *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1983).

Claim 1

Claim 1 presently stands rejected under 35 U.S.C. §102 as allegedly being anticipated by Applicants' Admitted Prior Art ("AAPA"). Claim 1 reads as follows:

"1. A processor purging system, comprising:
a translation lookaside buffer (TLB) having a plurality of translation pairs;
at least one memory cache; and
logic configured to make a determination whether at least one of the translation pairs corresponds to a purge signal and to purge, in response to the purge signal, each of the translation pairs in the TLB corresponding to the purge signal, ***the logic further configured to transmit, based on the determination, a purge detection signal indicative of whether at least one translation pair in the TLB corresponds to the purge signal and to determine, based upon the purge detection signal, whether to search the memory cache for information to be purged based on the purge signal.***" (Emphasis added).

Applicants respectfully assert that AAPA fails to disclose at least the features of claim 1 highlighted above. Thus, the 35 U.S.C. §102 rejection of claim 1 should be withdrawn.

In this regard, it is alleged in the Office Action that AAPA teaches "to determine, based upon the purge detection signal, whether to search the memory cache for a translation pair corresponding to the purge signal ([0005] lines 7-8, wherein the mini-TLBs and instruction queues are also purged as a result of the purge signal.)" See pages 4-5. The "purge signal" described at Paragraph [0005] is received by a processor, which then purges corresponding translation pairs, if any, in a translation lookaside buffer (TLB) in response to the "purge signal." The processor also purges other components, such as mini-TLBs and instruction queues based on the "purge signal." However, there is nothing in the AAPA to indicate that the purging or searching of such other

components is in any way based on whether any of the translation pairs in the TLB correspond to the "purge signal." Thus, the mini-TLBs and instruction queues are indeed purged "based on the purge signal," but there is nothing to indicate that any such component is searched or purged based on a "purge detection signal," which is based on "a determination whether at least one of the translation pairs (of the TLB) corresponds to the purge signal," as recited by claim 1.

For at least the above reasons, Applicants assert that the AAPA fails to disclose each feature of claim 1. Accordingly, Applicants respectfully request that the 35 U.S.C. §102 rejection of claim 1 be withdrawn.

Claims 3-8 and 21

Claims 3 and 4 presently stand rejected in the Office Action under 35 U.S.C. §102 as allegedly being anticipated by AAPA. Further, claims 5-8 presently stand rejected in the Office Action under 35 U.S.C. §103 as allegedly being unpatentable over AAPA in view of *Mathews* (U.S. Patent No. 6,560,689), and claim 21 has been newly added via the amendments set forth herein. Applicants submit that the pending dependent claims 3-8 and 21 contain all features of their respective independent claim 1. Since claim 1 should be allowed, as argued hereinabove, pending dependent claims 3-8 and 21 should be allowed as a matter of law for at least this reason. *In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988).

Claim 12

Claim 12 presently stands rejected under 35 U.S.C. §102 as allegedly being anticipated by

AAPA. Claim 12 reads as follows:

"12. A method for purging a processor, comprising the steps of:
detecting whether at least one of a plurality of translation pairs in a translation lookaside buffer (TLB) corresponds to a purge signal;
if at least one of the translation pairs in the TLB corresponds to the purge signal, purging the at least one translation pair corresponding to the purge signal;
transmitting, based on the detecting step, a purge detection signal indicative of whether at least one of the translation pairs in the TLB corresponds to the purge signal; and
determining whether to purge an instruction queue based on the purge detection signal." (Emphasis added).

For at least reasons similar to those set forth above in the arguments for allowance of claim 1, Applicants respectfully assert that the cited art fails to disclose at least the features of claim 12 highlighted above. Thus, the 35 U.S.C. §102 rejection of claim 12 should be withdrawn.

Claims 13, 14, 16, 22, and 23

Claims 13, 14, and 16 presently stand rejected in the Office Action under 35 U.S.C. §103 as allegedly being unpatentable over AAPA in view of *Mathews*, and claims 22 and 23 have been newly added via the amendments set forth herein. Applicants submit that the pending dependent claims 13, 14, 16, 22, and 23 contain all features of their respective independent claim 12. Since claim 12 should be allowed, as argued hereinabove, pending dependent claims 13, 14, 16, 22, and 23 should be allowed as a matter of law for at least this reason. *In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988).

Claim 17

Claim 17 presently stands rejected under 35 U.S.C. §102 as allegedly being anticipated by

AAPA. Claim 17 reads as follows:

"17. A processor purging method, comprising:
detecting whether at least one translation pair in a plurality of translation pairs within a translation lookaside buffer (TLB) corresponds to a purge signal;
transmitting, based on the detecting step, a purge detection signal indicative of whether at least one of the translation pairs corresponds to the purge signal;
determining, based upon the purge detection signal, whether to search the memory cache for information to be purged based on the purge signal; and
if at least one of the translation pairs in the TLB corresponds to the purge signal, purging from the TLB the at least one translation pair corresponding to the purge signal." (Emphasis added).

For at least reasons similar to those set forth above in the arguments for allowance of claim 1, Applicants respectfully assert that the cited art fails to disclose at least the features of claim 17 highlighted above. Thus, the 35 U.S.C. §102 rejection of claim 17 should be withdrawn.

Claim 24

Claim 24 has been newly added via the amendments set forth herein. Applicants submit that the pending dependent claim 24 contains all features of its independent claim 17. Since claim 17 should be allowed, as argued hereinabove, pending dependent claim 24 should be allowed as a matter of law for at least this reason. *In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988).

Claim 25

Claim 25 has been newly added via the amendments set forth herein. Claim 25 reads as follows:

"25. A processor, comprising:
an execution unit;
an instruction queue coupled to the execution unit;
a translation lookaside buffer (TLB) configured to store a plurality of translation pairs, each translation pair having a respective virtual address and a respective physical address; and
logic configured to receive a purge signal and to make a determination as to whether any of the translation pairs stored in the TLB correspond to the purge signal, the logic configured to purge from the TLB each translation pair corresponding to the purge signal, the logic further configured to determine, based on the determination, whether to purge the instruction queue in response to the purge signal."

Applicants respectfully assert that the cited art fails to disclose or suggest each of the above features of claim 25. Thus, claim 25 is allowable.

Claims 26 and 27

Claims 26 and 27 have been newly added via the amendments set forth herein.

Applicants submit that the pending dependent claims 26 and 27 contain all features of their respective independent claim 25. Since claim 25 should be allowed, as argued hereinabove, pending dependent claims 26 and 27 should be allowed as a matter of law for at least this reason.

In re Fine, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988).

Claim 28

Claim 28 has been newly added via the amendments set forth herein. Claim 28 reads as follows:

"28. A method, comprising the steps of:
 storing a plurality of translation pairs in a translation lookaside buffer (TLB),
 each of the translation pairs having a respective virtual address and a respective
 physical address;
 receiving a purge signal identifying at least one stale translation pair;
 determining whether any of the plurality of translation pairs in the TLB are
 identified by the purge signal;
 if at least one of the plurality of translation pairs in the TLB is identified by
 the purge signal, purging the at least one translation pair identified by the purge
 signal; and
 determining whether to purge at least one component of a memory cache
 other than the TLB based on the step of determining whether any of the plurality of
 translation pairs in the TLB are identified by the purge signal."

Applicants respectfully assert that the cited art fails to disclose or suggest each of the above features of claim 28. Thus, claim 28 is allowable.

Claims 29-31

Claims 29-31 have been newly added via the amendments set forth herein. Applicants submit that the pending dependent claims 29-31 contain all features of their respective independent claim 28. Since claim 28 should be allowed, as argued hereinabove, pending dependent claims 29-31 should be allowed as a matter of law for at least this reason. *In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988).

CONCLUSION

Applicants respectfully request that all outstanding objections and rejections be withdrawn and that this application and all presently pending claims be allowed to issue. If the Examiner has any questions or comments regarding Applicants' response, the Examiner is encouraged to telephone Applicants' undersigned counsel.

Respectfully submitted,

**THOMAS, KAYDEN, HORSTEMEYER
& RISLEY, L.L.P.**

By:



Jon E. Holland
Reg. No. 41,077
(256) 704-3900 Ext. 103

Hewlett-Packard Development Company, L.P.
Intellectual Property Administration
P.O. Box 272400
Fort Collins, Colorado 80527-2400